

What is claimed is:

1. A liquid crystal display comprising:
a pair of substrates provided opposite to each other;
a liquid crystal sealed between the pair of substrates;
alignment regulating structures formed on at least one
of the pair of substrates for regulating the alignment of
the liquid crystal; and

a plurality of pixel regions having both of a first area
in which the alignment regulating structures are disposed
at first intervals and which has a first threshold voltage
for driving of the liquid crystal and a second area in which
the alignment regulating structures are disposed at second
intervals smaller than the first intervals and which has a
second threshold voltage lower than the first threshold
voltage.

2. A liquid crystal display according to claim 1, wherein
the liquid crystal is aligned in four directions in the second
area of one pixel region, each of the directions being at
a differential angle of about 90°.

3. A liquid crystal display according to claim 2, wherein
the liquid crystal is substantially radially aligned in the
second area.

4. A liquid crystal display according to claim 1, wherein
the second intervals are 15 μm or less.

5. A liquid crystal display comprising:
a pair of substrates provided opposite to each other;
a liquid crystal sealed between the pair of substrates;
a pixel region having an area in which no alignment film
for aligning the liquid crystal is formed at least in a part
thereof; and

an alignment controlling layer obtained by setting an
alignment assisting material mixed in the liquid crystal.

6. A liquid crystal display according to claim 5, wherein
the alignment controlling layer has a plurality of different
anchoring energies in the pixel region.

7. A liquid crystal display according to claim 5, wherein
the alignment controlling layer is selectively formed in the
area in which no alignment film is formed.

8. A liquid crystal display according to claim 5, wherein
the alignment controlling layer is formed without using a
polymerization initiator.

9. A liquid crystal display according to claim 5, wherein
the alignment assisting material has photo-setting
properties.

10. A liquid crystal display according to claim 5,
wherein at least one of the pair of substrates has irregular

section on a surface thereof and wherein the alignment controlling layer is formed on the irregular section.

11. A method of manufacturing a liquid crystal display, comprising the steps of:

sealing a liquid crystal mixed with an alignment assisting material having photo-setting properties between two substrates provided opposite to each other;

setting the alignment assisting material by irradiating it with light under an irradiating condition that varies depending on areas to impart a pre-tilt angle that varies depending on the areas; and

forming an area having a different threshold voltage in part of each pixel region.

12. A method of manufacturing a liquid crystal display according to claim 11, wherein the irradiation condition is the dose of irradiation, the intensity of irradiation or the wavelength of irradiation.

13. A method of manufacturing a liquid crystal display according to claim 11, wherein the light is projected upon the liquid crystal without applying a voltage thereto.

14. A method of manufacturing a liquid crystal display, comprising the steps of:

fabricating a liquid crystal display panel by sealing a liquid crystal mixed with a reactive monomer between two

substrates provided opposite to each other;

tilting liquid crystal molecules in part of a pixel region of the liquid crystal display panel utilizing the speed of response of the liquid crystal that varies depending on parts of the pixel region;

polymerizing the reactive monomer to impart a different pre-tilt angle to the liquid crystal molecules in part of the pixel region; and

forming an area having a different threshold voltage in part of each pixel region.

15. A method of manufacturing a liquid crystal display according to claim 14, wherein the step of tilting the liquid crystal molecules in part of the pixel region comprises a step of applying a predetermined voltage that is a repetition of a high voltage and a low voltage to the liquid crystal at a frequency determined based on the speed of response.

16. A method of manufacturing a liquid crystal display according to claim 14, wherein a liquid crystal display panel having an area with a different cell thickness in part of each pixel region is used as the liquid crystal display panel.

17. A method of manufacturing a liquid crystal display according to claim 14, wherein a liquid crystal display panel having an area with a different initial pre-tilt angle in part of each pixel region is used as the liquid crystal display panel.

18. A method of manufacturing a liquid crystal display according to claim 14, wherein a liquid crystal display panel having an area in which the direction of an electric field is different in part of each pixel region is used as the liquid crystal display panel.

19. A liquid crystal display comprising:
a pair of substrates provided opposite to each other;
a storage capacitor bus line formed on one of the pair of substrates;

a plurality of divisional areas which is a plurality of divisions of each of pixel regions arranged on the one of the pair of substrates;

a pixel electrode formed at each of the divisional areas;
a thin film transistor formed at each of the divisional areas and connected to the pixel electrode;

a common electrode formed on the other of the pair of substrates;

a liquid crystal sealed between the pair of substrates;
and

a polymer obtained by polymerizing a polymeric component mixed in the liquid crystal while applying an AC voltage between the common electrode and the storage capacitor bus line.

20. A liquid crystal display according to claim 19, wherein the plurality of divisional areas in one pixel have different capacitance ratios, the capacitance ratio being

the ratio of a liquid crystal capacitance formed by the pixel electrode and the common electrode to a storage capacitance formed by the pixel electrode and the storage capacitor bus line.

21. A method of manufacturing a liquid crystal display according to claim 19, wherein the storage capacitor bus line is independently formed at each of the plurality of divisional areas in one pixel.

22. A liquid crystal display comprising:
a pair of substrates provided opposite to each other;
a gate bus line formed on one of the pair of substrates;
a plurality of divisional areas which are a plurality of divisions of each of pixel regions arranged on the one of the pair of substrates;

a pixel electrode formed at each of the divisional areas;
a thin film transistor formed at each of the divisional areas and connected to the pixel electrode;

a common electrode formed on the other of the pair of substrates;

a liquid crystal sealed between the pair of substrates;
and

a polymer obtained by polymerizing a polymeric component mixed in the liquid crystal while applying an AC voltage between the common electrode and the gate bus line.

23. A liquid crystal display according to claim 22,

wherein the plurality of divisional areas in one pixel have different capacitance ratios, a capacitance ratio being the ratio of a liquid crystal capacitance formed by the pixel electrode and the common electrode to a storage capacitance formed by the pixel electrode and the gate bus line.

24. A method of manufacturing a liquid crystal display in which a liquid crystal display panel is fabricated by sealing a liquid crystal including a polymeric component that is optically polymerized between a pair of substrates provided opposite to each other and in which the polymeric component is polymerized by irradiating it with light while applying a voltage to the liquid crystal, the method comprising the step of:

gradually extending the range of irradiation with light from part of a pixel region to the region as a whole while increasing the voltage.

25. A method of manufacturing a liquid crystal display according to claim 24, wherein a mask having an opening width smaller than the width of the pixel region and wherein an interval between the mask and the liquid crystal display panel is gradually increased to gradually extend the range of irradiation with light from the part of the pixel region to the region as a whole.

26. A method of manufacturing a liquid crystal display according to claim 24, wherein a mask having an opening width

smaller than the width of the pixel region and wherein the scattering of the light is gradually increased to gradually extend the range of irradiation with light from the part of the pixel region to the region as a whole.

27. A method of manufacturing a liquid crystal display according to claim 26, further comprising the steps of:

forming the mask on a surface of the liquid crystal display on the side thereof to be irradiated with light before the irradiation with light; and

removing the mask after the irradiation with light.

28. A method of manufacturing a liquid crystal display in which a liquid crystal display panel is fabricated by sealing a liquid crystal including a polymeric component that is optically polymerized between a pair of substrates provided opposite to each other and in which the polymeric component is polymerized by irradiating it with light while applying a voltage to the liquid crystal, the method comprising the step of:

moving the range of irradiation with light from part of a pixel region to another part while increasing the voltage.

29. A method of manufacturing a liquid crystal display according to claim 28, wherein a mask having an opening width smaller than the width of the pixel region and wherein the mask is moved relative to the liquid crystal display panel to move the range of irradiation with light from the part

of the pixel region to another part.

30. A vertical alignment type liquid crystal display comprising a liquid crystal layer provided between a first substrate and a second substrate, liquid crystal molecules being aligned substantially perpendicularly to the first and second substrates when no voltage is applied, at least one of the first and second substrates having an alignment controlling unit for controlling the direction of alignment of the liquid crystal in the liquid crystal layer, wherein:

the alignment controlling unit is a plurality of linear structures disposed in parallel with each other;

at least one of the first and second substrates has a first area in which intervals between adjacent ones of the linear structures are small and a second area in which intervals between adjacent ones of the linear structures are greater than those in the first area; and

a threshold voltage is high in a region of the liquid crystal layer facing the first area and is low in a region of the liquid crystal layer facing the second area, the liquid crystal molecules start tilting at the threshold voltage to cause the transmittance of the liquid crystal layer to change when a voltage is applied to the liquid crystal layer.

31. A liquid crystal display according to claim 30, wherein only one of the first and second substrates has the first area and the second area, and the other has a linear structure provided opposite to the second area.

32. A liquid crystal display according to claim 30, wherein only one of the first and second substrates has the first area and the second area.

33. A liquid crystal display according to claim 30, wherein both of the first and second substrates have the first area and the second area and are disposed such that the first area on the first substrate faces the second area on the second substrate and such that the first area on the second substrate faces the second area on the first substrate.

34. A vertical alignment type liquid crystal display comprising a liquid crystal layer provided between a first substrate and a second substrate, liquid crystal molecules being aligned substantially perpendicularly to the first and second substrates when no voltage is applied, the first substrate having an alignment controlling unit for controlling the direction of alignment of the liquid crystal in the liquid crystal layer, wherein:

the alignment controlling unit is a plurality of linear structures disposed in parallel with each other;

the first substrate has a first area in which intervals between adjacent ones of the linear structures are small and a second area in which intervals between adjacent ones of the linear structures are greater than those in the first area; and

a region of the liquid crystal layer facing the first

area and a region of the liquid crystal layer facing the second area have different threshold voltages at which the liquid crystal molecules start tilting to cause the transmittance of the liquid crystal layer to change when a voltage is applied to the liquid crystal layer.

35. A liquid crystal layer according to claim 30, wherein the plurality of linear structures disposed in parallel in the first area and the second area are substantially in parallel with each other.

36. A liquid crystal layer according to claim 30, wherein the plurality of linear structures disposed in parallel in the first area and the second area extend orthogonally to each other.

37. A liquid crystal display according to claim 30, wherein the structure is a protrusion protruding into the liquid crystal layer, a recess that is sunk oppositely to the liquid crystal layer or an electrode slit that is a local blank in an electrode in a display area.

38. A liquid crystal display according to claim 37, wherein the structure is protrusions protruding into the liquid crystal layer and wherein any of the width, the pitch of arrangement and the electrical resistance of the protrusions is different between the first area and the second area.

39. A liquid crystal display according to claim 37, wherein the structure is electrode slits that are local blanks in the electrode in the display area and wherein any of the width, the pitch of arrangement and the electrical resistance of the electrode slits is different between the first area and the second area.

40. A liquid crystal display according to claim 37, wherein the structure is recesses that are sunk oppositely to the liquid crystal layer and wherein any of the width, the pitch of arrangement and the electrical resistance of the recesses is different between the first area and the second area.